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NOTICE OF ALLOWANCE AND FEE(S) DUE

Philmore H. Colburn II Cantor Colburn LLP 55 Griffin Road South

Bloomfield, CT 06002

02/19/2009

EXAMINER

TRUONG, CAMQUY

ART UNIT PAPER NUMBER

2195

UNITED STATES DEPARTMENT OF COMMERCE United States Patent and Trademark Office Address: COMMISSIONER FOR PATENTS P.O. Box 1450 Alexandria, Virginia 22313-1450

DATE MAILED: 02/19/2009

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/723,405	11/25/2003	Frank William Brice JR.	POU920030188US1	9082

TITLE OF INVENTION: MEMORY MAPPED INPUT/OUTPUT VIRTUALIZATION

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$300	\$0	\$1810	05/19/2009

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

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Bloomfield, CT	06002						(Depositor's name)
							(Signature)
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APPLICATION NO.	FILING DATE		FIRST NAMED INVENTO)R	ATTO	RNEY DOCKET NO.	CONFIRMATION NO.
10/723,405 TITLE OF INVENTION	11/25/2003 I: MEMORY MAPPED	INPUT/OUTPUT VIRTU	Frank William Brice J JALIZATION	₹.	PO	0U920030188US1	9082
APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DU	E PREV. PAID ISSU	JE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$300	\$0		\$1810	05/19/2009
EXAM	IINER	ART UNIT	CLASS-SUBCLASS	7			
TRUONG,	CAMQUY	2195	718-001000				
 Change of correspondence address or indication of "Fee Address" (37 CFR 1.363). Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached. "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a Customer Number is required. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON PLEASE NOTE: Unless an assignce is identified below, no assigner recordation as set forth in 37 CFR 3.11. Completion of this form is NO 				to 3 registered pate tively, gle firm (having as r agent) and the nan torneys or agents. If the printed.	nt attorn a memb nes of u no nan	p to cis 3	ocument has been filed for
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.	
10/723,405 11/25/2003		Frank William Brice JR.	POU920030188US1	9082	
7590 02/19/2009			EXAMINER		
Philmore H. Colb	ourn II	TRUONG, CAMQUY			
Cantor Colburn LL	=		ART UNIT	PAPER NUMBER	
55 Griffin Road South Bloomfield, CT 06002			2195 DATE MAILED: 02/19/200	9	

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)

(application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 1326 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 1326 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

	Application No.	Applicant(s)
A 6 A.U	10/723,405	BRICE ET AL.
Notice of Allowability	Examiner	Art Unit
	CAMQUY TRUONG	2195
The MAILING DATE of this communication apperature All claims being allowable, PROSECUTION ON THE MERITS IS herewith (or previously mailed), a Notice of Allowance (PTOL-85) NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RI of the Office or upon petition by the applicant. See 37 CFR 1.313	(OR REMAINS) CLOSED in this app or other appropriate communication GHTS. This application is subject to and MPEP 1308.	olication. If not included will be mailed in due course. THIS withdrawal from issue at the initiative
1. This communication is responsive to the amendment filed of	on 9 January 2009 and terminal disc	<u>laimer</u> .
2. The allowed claim(s) is/are 1-9, 12-19 now renumbered as	<u>claims 1-17</u> .	•
 3.	been received. been received in Application Nocuments have been received in this action of this communication to file a reply all the series of this application. been received in Application to file a reply all the series reason (s) why the oath or declarate the submitted. con's Patent Drawing Review (PTO-1) and Amendment / Comment or in the Comment of the drawing he header according to 37 CFR 1.121 (consist of BIOLOGICAL MATERIAL not series and series are series of the series of	national stage application from the complying with the requirements S AMENDMENT or NOTICE OF tion is deficient. 948) attached Office action of the back) of ti). nust be submitted. Note the
Attachment(s) 1. ☑ Notice of References Cited (PTO-892) 2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948) 3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date 4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material	5. ☐ Notice of Informal Pa 6. ☑ Interview Summary Paper No./Mail Dat 7. ☑ Examiner's Amendn 8. ☐ Examiner's Stateme 9. ☐ Other /Meng-Ai An/ Supervisory Patent Examiner	(PTO-413), e nent/Comment nt of Reasons for Allowance
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	Application No.	Applicant(s)
Interview Summary	10/723,405	BRICE ET AL.
interview Summary	Examiner	Art Unit
	CAMQUY TRUONG	2195
All participants (applicant, applicant's representative, PTO	personnel):	
(1) <u>CAMQUY TRUONG</u> .	(3)	
(2) <u>Sean F. Sullian</u>	(4)	
Date of Interview: <u>08 February 2009</u> .		
Type: a)⊠ Telephonic b)□ Video Conference c)□ Personal [copy given to: 1)□ applicant 2	r) ☐ applicant's representative	
Exhibit shown or demonstration conducted: d) Yes If Yes, brief description:	e)⊠ No.	
Claim(s) discussed: 1,18 and 19.		
Identification of prior art discussed:		
Agreement with respect to the claims f) \boxtimes was reached. g) was not reached. h) N	/A.
Substance of Interview including description of the general reached, or any other comments: <u>Applicant agreed to amer</u>		
(A fuller description, if necessary, and a copy of the amend allowable, if available, must be attached. Also, where no coallowable is available, a summary thereof must be attached	opy of the amendments that w	
THE FORMAL WRITTEN REPLY TO THE LAST OFFICE A INTERVIEW. (See MPEP Section 713.04). If a reply to the GIVEN A NON-EXTENDABLE PERIOD OF THE LONGER INTERVIEW DATE, OR THE MAILING DATE OF THIS INTIFILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW ON reverse side or on attached sheet.	last Office action has already OF ONE MONTH OR THIRTY ERVIEW SUMMARY FORM, \	been filed, APPLICANT IS DAYS FROM THIS WHICHEVER IS LATER, TO
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	/Meng-Ai An/ Supervisory Patent Examiner, Art Ur	nit 2195

Application/Control Number: 10/723,405 Page 2

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Examiner's Amendment

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

- 2. Authorization for this examiner's amendment was given in a telephone interview with Mr.Sean F. Sullivan (Registration number: 38,328) on 2/9/09.
- **3.** The claims have been amended as follows:
 - 1. A method of performing memory mapped input output operations to an alternate address space comprising:

establishing a first instruction directed to a first memory mapped input output alternate address space associated with an adapter to store data in accordance with resource address designation, said resource address designation configured for decomposition thereof such that said first memory mapped input output alternate address space associated with said adapter is accessible;

establishing a second instruction directed to said first memory mapped input output alternate address space associated with an adapter to load data in accordance with said resource address designation;

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allocating, through a host program, at least one of a real resource and a virtual resource associated with said first memory mapped input output alternate address space to a guest program started by the host program;

ensuring that a process executed by the guest program corresponds to said at least one of the real resource and the virtual resource allocated to the guest program, in a manner that is not visible to the quest program; and

wherein said process issues at least one of said first instruction and said second instruction and thereby causes execution of at least one of said store and load with said first memory mapped input output alternate address space.

- 2. The method of Claim 1 further comprising allocating, through the host program on behalf of the guest program, an error storage area associated with said resource.
- 3. The method of Claim 1 further including virtualization of a resource of one of said adapter to store data and said adapter to load data to a second-level guest process.
- 4. The method of Claim 3 wherein said virtualization of a resource is accomplished and distinguished from a real resource by partitioning a range of resource identifiers into a plurality of portions;

wherein at least one portion corresponds to a virtual resource; and

wherein when at least one of said first instruction and said second instruction specifies a resource identifier corresponding to said at least one portion, the guest program issuing instruction exits, and the host program resumes execution in order to emulate said at least one of said first instruction and said second instruction originally issued by the guest program.

- 5. The method of claim 3 wherein said virtualization provides direct access to at least one of a real resource and a virtual resource of an adapter by a problem-state second -level guest process.
- 6. The method of claim 5 wherein said access is accomplished without involvement from a kernel of a guest operating system; and permits said process operating in a problem-state maximum efficiency in performing the primary input output capabilities provided by said adapter and the associated resources allocated to said process.
- 7. The method of claim 3 further including separating another process operating under said operating system; wherein an separating is established on a perresource basis during said allocating and is enforced during execution of at least one of said first and said second instructions.

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8. The method of claim 1 wherein said first alternate address space is not a portion of the main address space from which said process is executing.

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9. The method of claim 1 wherein said process issuing said at least one of said first instruction and said second instruction and thereby causes execution of at least one of said store and load with said first alternate address space operates in a problem state of a machine.

10-11. Cancelled

- 12. The method of claim 1 wherein at least one of said first instruction and said second instruction is executed without supervisory state intervention.
- 13. The method of claim 1 wherein said first instruction and said second instruction are semiprivileged instructions that may be executed in a problem state, wherein ownership of a specified resource of a specified adapter determines a privilege required for execution of said semiprivileged instructions.
- 14. The method of claim 1 further including a second memory mapped input output alternate address space associated with a second adapter.

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- 15. The method of claim 14 wherein a storage location in said first memory mapped input output alternate address space maps to a different address than the same location in said second memory mapped input output alternate address space.
- 16. The method of claim 1 wherein said adapter includes address spaces as partitions of said alternate address space.
- 17. The method of claim 1 wherein an address space is governed by at least one of a resource type and storage area types associated with said adapter.
- 18. Storage medium encoded with a computer-readable computer program code, said code including instructions, when executed, cause a computer to implement a method of performing memory mapped input output operations to an alternate address space, the method comprising:

establishing a first instruction directed to a first memory mapped input output alternate address space associated with an adapter to store data in accordance with resource address designation, said resource address designation configured for decomposition thereof such that said first memory mapped input output alternate address space associated with said adapter is accessible;

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establishing a second instruction directed to said first memory mapped input output alternate address space associated with an adapter to load data in accordance with said resource address designation;

allocating, through a host program, at least one of a real resource and a virtual resource associated with said first memory mapped input output alternate address space to a guest program started by the host program;

ensuring that a process executed by the guest program corresponds to said <u>at least one of the real resource and the virtual resource allocated to the guest program</u>, in a manner that is not visible to the quest program; and

wherein said process issues at least one of said first instruction and said second instruction and thereby causes execution of at least one of said store and load with said first memory mapped input output alternate address space.

19. A system for performing memory mapped input output operations to an alternate address space comprising:

a processor;

a means for establishing a first instruction directed to a first memory mapped input output alternate address space associated with an adapter to store data in accordance with resource address designation, said resource address designation configured for decomposition thereof such that said first memory mapped input output alternate address space associated with said adapter is accessible;

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a means for establishing a second instruction directed to said first memory mapped input output alternate address space associated with an adapter to load data in accordance with said resource address designation;

a means for allocating, through a host program, at least one of a real resource and a virtual resource associated with said first memory mapped input output alternate address space to a guest program started by the host program;

a means for ensuring that a process executed by the guest program corresponds to said <u>at least one of the real resource</u> and the <u>virtual resource</u> allocated to the guest program, in a manner that is not visible to the quest program; and

wherein said process issues at least one of said first instruction and said second instruction and thereby causes execution of at least one of said store and load with said first memory mapped input output alternate address space.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CAMQUY TRUONG whose telephone number is (571)272-3773. The examiner can normally be reached on 9:00am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng Ai An can be reached on (703)305-9678. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Meng-Ai An/ Supervisory Patent Examiner, Art Unit 2195 Camquy Truong

Applicant(s)/Patent Under Application/Control No. Reexamination 10/723,405 BRICE ET AL. Notice of References Cited Art Unit Examiner · Page 1 of 1 2195 **CAMQUY TRUONG** U.S. PATENT DOCUMENTS **Document Number** Date Classification Name Country Code-Number-Kind Code MM-YYYY US-6,598,144 07-2003 7.11/203 Bailey et al. Α US-4,916,608 04-1990 Shultz, Steven S. 718/104 В US-С US-D US-Ε US-F US-G USн US-١ US-J US-Κ US-L US-М FOREIGN PATENT DOCUMENTS Document Number Date Name Classification Country Country Code-Number-Kind Code MM-YYYY Ν 0 Ρ Q R s Т **NON-PATENT DOCUMENTS** Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages) U

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).) Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

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